eCMAR SECTION INSTRUCTIONS:
Ponds and Lagoon Leakage

1. Pond Lining

1.1 What material was used to line your ponds?

Enter in the space provided immediately below the question the type of liner, which was used to seal your ponds. All wastewater treatment lagoons/ponds are required to be sealed to prevent exfiltration. Identify in response to this question whether your lagoon is sealed with a synthetic liner or a soil liner such as clay or soil-bentonite. For more information see NR110.24(4) of the Wisconsin Administrative Code.

2. Flow Measurements

2.1 Did you measure influent flow to your wastewater ponds or lagoons?

Click on the appropriate "YES" or "NO" button. If you answer "YES", you must enter your method of flow measurement in the space provided in question 2.1.

2.1.1 Method of influent flow measurement:

As an example, you could enter, v-notch weir or parshall flume, ultrasonic depth sensor followed by continuous recording. If you clicked "YES" in question 2.1, you will not be able to complete this portion of the CMAR unless you comment in the comment space in question 2.1. For more information regarding flow metering requirements, see NR 108.06(4)(b), NR 110.15 (4)(c) and NR218.05(1) of the Wisconsin Administrative Code.

2.2 Did you measure effluent flow discharged from your wastewater system either to the land disposal system or to the receiving stream?

Click on the appropriate "YES" or "NO" button. If you answer "YES", you must enter your method of flow measurement in the space provided in question 3.1. If you didn't discharge any flow in the previous year, then click on "NO DISCHARGE."

2.2.1 Method of effluent flow measurement:

As an example, you could enter, v-notch weir or parshall flume, ultrasonic depth sensor followed by continuous recording. If you clicked "YES" in question 2.2, you will not be able to complete this portion of the CMAR unless you comment in the comment space in question 2.2. For more information regarding flow metering requirements, see NR 108.06(4)(b), NR 110.15 (4)(c) and NR218.05(1) of the Wisconsin Administrative Code.

3. Total Flow Volumes

3.1 Total monthly influent and effluent flow volumes from the pond/lagoon system during the last calendar year.

Influent and effluent flow volumes are pre-generated in the table. This data was obtained from the eDMRs submitted throughout the year. Check the total monthly influent and effluent flows to ensure they are correct. If the numbers disagree with your eDMR reported values, contact your DNR District Wastewater Engineer or Specialist by clicking the 'REPORT ISSUE' button or by phone.

3.2: From the yearly total influent and effluent volumes from part 4 above, total effluent is divided by total influent and converted to a percent of volume loss.

Question 3.2 provides a ratio of the effluent discharged to the influent volume your pond received for the previous year. It then provides the percentage of influent lost and not discharged with effluent. This calculation can be an indicator of the integrity of your pond's liner and correspondingly the potential impact to groundwater. Given the inherent accuracy of flow metering equipment, weather events, precipitation, evaporation, storage of water to be discharged etc. it isn't surprising that the influent and effluent for the previous year won't exactly match on many sealed ponds.

It's possible that in some cases there may be more effluent than influent. A negative % of influent lost indicates more effluent being discharged than influent coming into the system. This is perhaps because of storage the previous year, a faulty flow meter, or significant precipitation. In still other cases a high percentage of influent may appear to be lost when in reality it is simply stored to be discharged the following year. Storage of wastewater is addressed further in question 5.1. There are no points generated within this question as a result of high percentages of influent lost, however points may be generated in question 7 dependent upon the leakage rate determined in questions 5 and 6.

A 20% loss of influent or greater can be significant. As stated, the loss rate is evaluated further in questions 5 and 6.

4. Surface Area

4.1 What was the total wastewater surface area of the ponds/lagoons at operating level (do not include seepage cells)?

This information generally is available in your O&M manual or design report. It can also be measured if you don't have this information readily available. Enter the wastewater surface acreage in the space provided immediately below the question. Seepage cells should not be included.

5. Leakage Rate Estimation

5.1 Total influent volume (in MG) minus total effluent volume (in MG) plus or minus the change in pond/lagoon storage (in MG) is the net wastewater loss. The net loss divided by 0.000365 equals the estimated leakage amount in gpd.

Question 5.1 provides the leakage rate in gallons per day. This is done by subtracting the effluent from the influent in million gallons to determine the net loss in million gallons. This information was generated from question 4. Storage in most cases is not an issue and defaults to zero. This net loss is then divided by the factor 0.000365 to convert the net loss in million gallons per year into a gallon per day loss.

If at your facility you store wastewater such that in some years you release more or less than what comes in as influent, then you should consider incorporating a storage volume to calculate the net loss. For example if you had an annual influent of 12 MG and the annual effluent for the same year of 3 MG but 9 MG was in storage and available for discharge, then the net loss would be 12 MG influent - 3 MG effluent - 9 MG available in storage which could have been discharged or a net water loss of 0 MG. Similarly if you had an annual influent of 12 MG and the annual effluent for the same year of 16 MG of which 4 MG came from storage of influent from the previous year, then the net loss would be 12 MG influent - 16 MG effluent + 4 MG previous years storage or again a net loss of 0 MG, Note as you click the change sign button from + to - or vice versa, the storage change shifts from a storage increase to a storage decrease. If you are using storage, it must be an approved method by the Department. Contact your DNR representative to assure accurate determination of storage volumes.

5.2 CMAR Estimated Leakage Rate in gallons per acre per day (GPAD): The CMAR Estimated Leakage Rate in GPAD is the leakage amount in GPD
(from part 5.1) divided by the total pond surface area (from question 4).

Question 5.2 determines the leakage rate in gallons per acre per day. This is determined by taking the leakage rate in question 5.7 and dividing it by the number of acres you reported in question 4. NR 110.24(4) of the Wisconsin Administrative Code provides for allowable exfiltration rates of 1000 gallons per acre per day.

6. On Site Leakage Testing

6.1 Did you conduct an on-site, field water balance/leakage test on your ponds or lagoons that was approved by the Department and is still valid?

Click on the appropriate "YES" or "NO" button. In a number of situations, formal water balance/leak tests were conducted to evaluate liner integrity. If your facility had one of these evaluations and the results are still valid and accepted by the Department, it is acceptable to base the leakage rate in the CMAR on the formal evaluation. Accordingly, if your answer is "YES" then provide the year that the study was done.

If you selected "YES", enter the Field Test Calculated Leakage Rate for your ponds/lagoons. Provide the field test calculated leakage rate from your on-site formal water balance/leak test in the space provided in question 6.1.

6.2 Leakage Rate Comments

This is an optional field, however, if you have additional comments, please include them here.

7. Estimated Leakage Rate and Points

7.1 The CMAR Estimated Leakage Rate (from 5) is used to determine the points generated in the table below.

The points generated are in accordance with the table and the CMAR estimated rate determined in questions 5 and/or 6.